DATA NEEDS GUIDANCE

for the

"ENVIRONMENTAL STREAMLINING PROCESS GUIDE"

This document outlines information useful to the development of transportation projects and the evaluation of their impacts, under the MATE streamlining process. The objectives of this guidance are to promote concurrent decisionmaking in transportation projects; to provide regional consistency in the way those projects are developed; and to facilitate the streamlining of the approval and authorization process.

A committed multi-disciplinary/interagency team is required for this approach to work effectively. The initial and most important task of the team is to agree on the level of detail which should be provided for each stage of project development. The team should identify existing environmental data, determine the adequacy of the data, and identify additional information needs. Because all projects are not the same, the determination of which of the listed items apply will be made on a case by case basis.

This data needs guidance is keyed to the steps in the Mid-Atlantic Transportation and Environment Streamlining Framework. Step 1 of the framework (Transportation Planning) is not included in this guidance. The extent of coordination between local planning organizations and state and federal resource agencies during Step 1 will vary; therefore, the degree of involvement and information needs will be determined on a case-by-case basis.

ENVIRONMENTAL ISSUE	Process Steps 2 & 3 - Scoping & Purpose and Need
AGRICULTURAL RESOURCES	• map showing agricultural areas (agricultural easements, active farms, prime and unique farmlands, etc.)
AIR QUALITY	• National Toxics Inventory, Toxics Release Inventory or local air toxics inventory • Identification of Transportation Air Quality Mitigation Measures (TAQMM). Examples of TAQMM could include Bus Retrofits, Anti-idling policies, Transportation Demand Management, restriction on diesel engine vehicles, congestion pricing. • Obtain current MPO programming document and regional air quality conformity analysis data. Address regional conformity as well as project-level conformity when applicable. • For major highway improvement projects in highly congested metropolitan areas alternative analysis should consider market-based approaches in addition to conventional alternatives. These market-based approaches involve congestion pricing strategies that include but not limited to High Occupancy Toll (HOT) lanes, Variable Tolls on toll roads, Variable Tolls on existing free roads, and Fast and Intertwined Regular (FAIR) lanes, Pricing strategies may be included as alternatives by themselves or as add-ons to the base case alternative or in combination with alternatives involving roadway capacity enhancements.
AQUATIC RESOURCES	**Wetlands** • aerial photographs or comparable base mapping showing wetlands • calculated size of each wetland **Waters other than Wetlands** • aerial photographs or comparable base mapping showing other Waters of the U.S., including special aquatic sites other than wetlands • map showing coastal zone boundaries • state water classifications

ENGINEERING INFORMATION	• Purpose and Need statement
	  • accident number/location, type (angle, rear-end, etc.), severity (property damage, injury, death), rate
	  • Average Daily Traffic (existing, proposed), AM/PM peak hour volumes, travel demand & desire, traffic mix (% cars, trucks), origin/destination, delay time, queue lengths, seasonal volume fluctuations/special event data, Level of Service
	  • discontinuity of roadway classification, statewide & regional transportation network
	  • existing & planned highway, transit, aviation, bicycle, and pedestrian facilities, patronage demand surveys
	  • deficiencies in highway geometry, load limits; pavement surveys; documented drainage problems
	• map showing study area boundaries & project limits

FISH & WILDLIFE RESOURCES	**Terrestrial Resources** • map showing land use cover types (natural areas, grasslands, forest interior habitat, wildlife corridors, winter cover, mature forest, and major forest patch network) • overlay map showing high quality wildlife habitats (grasslands >40 acres, interior forest patches, wildlife corridors, natural areas, etc.) **Threatened and Endangered Species** • map showing known, historic, or potential locations for both state and federally listed species (polygon mapping) **Fish and Wildlife Species** • list of primary species using the study area • map showing Essential Fish Habitat, shellfish beds, and spawning habitat
HAZARDOUS WASTE & BROWNFIELDS	• map showing known or potential hazardous waste and brownfield sites
CULTURAL RESOURCES - HISTORIC & ARCHEOLOGY	**Historic** • map showing listed or previously surveyed properties in study area, including historic standing structures, landmarks, battlefields, and rural historic landscapes, as well as traditional cultural properties • Initiation of Section 106 consultation, including identification of potential consulting parties, and preliminary Area of Potential Effect (APE). **Archeology** • map showing high archeological probability areas in study area, based on best professional judgment, as well as known disturbed areas such as strip mines, borrow sites, dams, etc. • Initiation of Section 106 consultation, including identification of potential consulting parties, and preliminary Area of Potential Effect (APE).
PHYSIOGRAPHY	• map showing physiographic regions or provinces, wellhead protection areas, sole source aquifers, watersheds, floodplains, soil types, limiting rock formations, public water supply locations, etc.
SOCIAL/ ECONOMIC	• map (Andersen Level II mapping or aerial photo) showing <u>existing and future</u> land uses (developed/ undeveloped areas, including residential, commercial, industrial areas, major employment sites, hospitals, universities, schools, shopping centers, government services, parks, recreation and entertainment centers, key community and cultural facilities, fire stations, places of worship, recreational trails, major utilities, water/ sewer, Environmental Justice communities, etc.) • documentation of any alternative land use scenarios, if available • existing and forecasted population & employment make-up (income, ethnicity, age, auto/transit dependency, etc.) • future development potential or trends

ENVIRONMENTAL ISSUE	Process Step 4: Alternatives Development
AGRICULTURAL RESOURCES	• revised mapping, as appropriate, based on public and agency input • preliminary estimate of impacts
AIR QUALITY	• no additional products
AQUATIC RESOURCES	**Wetlands** • updated mapping showing field-checked wetland boundaries (identified through previous mapping efforts) • for small study areas or study areas with extensive wetland resources and or seasonally saturated wetlands, it may be prudent to provide detailed wetland mapping based on field evaluation techniques • Cowardin classification for each mapped wetland resource • preliminary estimate of impacts **Waters other than Wetlands** • comprehensive identification of all aquatic features, including special aquatic sites • existing water quality information - biological and chemical • Cowardin or state classifications for each mapped aquatic feature • dimensions of each feature (width, depth, length and total area) • preliminary estimate of impacts
ENGINEERING INFORMATION	• map of environmentally constrained areas • design speed(s) and facility type (functional classification, access control level) • map showing general horizontal and vertical geometry of alignments; preliminary access locations; ancillary facility locations (toll plazas, weigh stations, rest areas, transit centers, park & ride lots, etc.); general structure locations and types; right-of-way band width including constrained areas • diagrams showing typical sections (number and width of lanes, shoulder width, median width, closed vs. open section (drainage), pedestrian/bike facilities, HOV/bus lane location and width) • Transportation Demand Management and Transportation Systems Management strategies • preliminary cost estimate(s)
FISH & WILDLIFE RESOURCES	**Terrestrial Resources** • field verified aerial photograph or map showing high quality wildlife habitat (i.e., grasslands, interior forest, mature forest, wildlife corridors, winter cover, major forest patch networks, etc.) • plant species composition and structural diversity for each preliminary corridor • preliminary estimate of impacts **Threatened and Endangered Species** • map showing the locations of extant populations or habitats for all listed species • surveys of potential habitat, to establish occurrence or absence of listed species • preliminary estimate of impacts **Fish and Wildlife Species** • refined list of primary species, based on alternatives developed • map showing high quality fish habitat • preliminary estimate of impacts
HAZARDOUS WASTE & BROWNFIELDS	• revised mapping, as appropriate, based on public and agency input • preliminary estimate of impacts
CULTURAL RESOURCES - HISTORIC & ARCHEOLOGY	**Historic** • historic context (type of resources expected to be within the study area, such as rural historic landscapes; traditional cultural properties; transportation corridors; commercial, residential and historic districts; etc.) • preliminary identification of potential historic structures (based on a windshield survey), depending on the type and size of the project • map showing probable Section 4(f) resources in the study area • preliminary estimate of impacts **Archeology** • geomorphologic survey results • archeological predictive model based on archeological context • map showing preliminary Limits of Disturbance • map showing probable Section 4(f) resources in the study area • preliminary estimate of impacts
PHYSIOGRAPHY	• preliminary estimate of impacts
SOCIAL/ ECONOMIC	• revised mapping, as appropriate, based on public and agency input • map showing probable Section 4(f) resources in the study area • documentation of ownership, jurisdiction, recreation plans and covenants for publicly owned parks and recreation facilities • documentation of management plans for large multiple-use properties such as state and national forests, wildlife management areas, etc. • map showing Noise Sensitive Areas and/or receptors (homes, apartment complexes, hospitals, nursing homes, parks, etc.) within 500' to 1000' of alternative alignments • preliminary estimate of impacts

ENVIRONMENTAL ISSUE	**Process Step 5: Detailed Alternative Analysis & Draft NEPA Document** Comparative analysis of potential impacts (by alternative) is performed for each resource, and the results are summarized in the draft environmental document.
AGRICULTURAL RESOURCES	• refined preliminary estimate of impacts, including direct and indirect impacts to farm parcels and operations, as well as prime and unique farmland
AIR QUALITY	• Identification of sensitive receptors areas with close proximity (100m or less) to the project.study area. Sensitive receptors areas are areas where the subpopulation (including the elderly and children) may be at risk to potential exposure. These sensitive receptor areas could include: schools, daycares, hospitals, residential areas (including Environmental Justice areas) and nursing homes • Identification of Construction Air Quality Mitigation Measures (CAQMM). Examples of CAQMM could include: reducing the amount of construction, using alternative fuel vehicle (including biofuels), use of low sulfur duel, retrofit diesel equipment, Anti-idling policies, keeping construction far from people • Comparative emission analysis (construction and operation) of the alternatives • Applicable to Transportation Management Areas (TMAs) for additional traffic or capacity. Congestion Management System ICMS) shall be considered in evaluating Transportation System Management (TSM) and Transportation Demand Management (TDM) strategies. Include TSM and TDM commitments in environmental documents. The CMS is intended to be a systematic way of monitoring, measuring and diagnosing the causes of congestion on a region's multi-modal transportation systems; evaluating and recommending alternative stategies to manage or mitigat regional congestion; and monitoring and evaluating the performance of strategies implemented to manage or mitigate congestion.
AQUATIC RESOURCES	Note: Jurisdictional determination by USACE of aquatic resource mapping (wetlands and other waters); depends on project timing and study area or type of resources - determine earlier in order to receive permit earlier **Wetlands** • map showing field identification of wetlands by project sponsor, both location and extent using 1987 USACE Wetland Delineation Manual (USACE may require a jurisdictional determination for all alternatives depending on the project and the type, quantity, and quality of wetlands) • functional assessment of all wetlands, based on an assessment methodology to be determined by the team (specific info. regarding characteristics of wetlands, including biotic communities/species composition, hydrology, unique features, etc.) • size and impact information for each affected wetland (acres, square feet) • secondary and cumulative impacts of actions, such as isolation, fragmentation, alteration of hydrology (for each wetland affected) • wetland avoidance and minimization measures for each alternative • for wetland compensatory mitigation, description and mapping of potential mitigation sites or opportunities in the watershed (in the draft NEPA document) • mitigation commitments, including acreage ratios for wetland replacement (in the draft NEPA document) **Waters other than Wetlands** • map showing field identification of other waters, both location and extent • characteristics/descriptions of all waters (dynamics, structure, riparian zone characteristics, water quality, etc., including any state stream classification) • crossing types: bridges or culverts, length, width, height and alignment (perpendicular or parallel) • impacts to FEMA mapped floodplains and floodways • channelization locations and dimensions • stream relocation locations, dimensions, and type/quality of habitat affected by proposed relocation • bank stabilization locations and dimensions • secondary and cumulative impacts to other waters at all crossings • avoidance and minimization measures for waters • for compensatory mitigation, description in NEPA document of potential opportunities in the watershed for stream and water quality improvements, including stream bank fencing, restoration of riparian corridors, etc.
ENGINEERING INFORMATION	• map(s) showing refined horizontal and vertical alignments, with curve data and stationing, (including impact avoidance, minimization and compensation) • refined typical section(s) and intersection/interchange configurations • approximate cross-sections in constrained areas • potential stormwater management locations and approximate sizes and preliminary hydraulic and hydrology studies • conceptual maintenance of traffic • refined structure type/size/location details (bridge and/or culvert lengths, widths, and heights; pier and abutment locations; etc.) • potential locations of noise barriers and retaining walls • refined cost estimates • assessment of constructability issues
FISH & WILDLIFE RESOURCES	**Terrestrial Resources** • documentation of wildlife habitat quality (species diversity, structural diversity, wildlife occurrence), based on field assessments of each alignment • Habitat Evaluation Procedure (HEP) or other habitat functional assessment, as appropriate • map showing alignments refined to avoid and minimize impacts to high quality wildlife habitat • description of potential measures to maintain/re-establish travel corridors between quality wildlife habitats through passage structures • compensatory mitigation plans for all unavoidable impacts to high quality wildlife habitat • analysis of impacts to wildlife habitat, including secondary and cumulative effects, as necessary **Threatened and Endangered Species** • map showing alignments refined to avoid and minimize impacts to all known or potential habitat for listed species • analysis of impacts to T&E species, including secondary and cumulative effects, as necessary **Fish and Wildlife Species** • analysis of potential impacts to primary fish and wildlife species, including secondary and cumulative effects, as necessary • analysis of potential impacts to Essential Fish Habitat and associated species, including surveys as needed
HAZARDOUS WASTE & BROWNFIELDS	• documentation of contaminated media, including nature, concentration and extent of contamination • secondary and cumulative effects analysis, as necessary
CULTURAL RESOURCES - HISTORIC & ARCHEOLOGY	**Historic** • map showing APE, refined based on alternatives carried through for further study • detailed identification abd evaluation structures survey (type of resource such as historic district, landscape, properties, etc.; characteristics which make each resource eligible; map(s) showing the boundary of any identified eligible resource depending on the type and size of the project) • documentation of SHPO concurrence on APE, National Register eligibility and potential effects • evaluation of alternatives or alternative modifications which totally avoid Section 4(f) resources • secondary and cumulative effects analysis, as necessary **Archeology** • map showing Limits of Disturbance • map showing APE, refined based on alternatives carried through for further study • Phase I survey results (presence or absence of archeological resources through literature searches, spot shovel tests, etc.) • Phase II survey results (National Register Eligibility, vertical and horizontal limits) • documentation of SHPO concurrence on APE, National Register eligibility and potential effects • evaluation of alternatives or alternative modifications which totally avoid Section 4(f) and National Register eligible sites • secondary and cumulative effects analysis, as necessary
PHYSIOGRAPHY	• geo-technical studies as necessary (identification of acid bearing rock, hydrogeology, important structural features, etc.) • secondary and cumulative effects analysis, as necessary

SOCIAL/ ECONOMIC	• community impact assessment, including:
	  • public buildings/space
	  • residences by type of housing (single family, low-density multiple housing, and heavy multiple housing)
	  • major employment sites
	  • Title VI, EJ and other population groups
	  • travel patterns and transportation choices between origin and destinations
	  • community and cultural factors such as concentrations of elderly, disabled, religious groups, etc.
	  • provision of community services, such as ambulance, fire and police services
	  • community cohesion
	  • residential, commercial, industrial and community facility displacements
	  • disproportionate adverse impacts to minority and low-income populations (EJ)
	  • noise analysis report, including the potential for noise abatement and mitigation measures
	  • sensitive visual "sites" and potential vistas, such as parks, stream crossings, communities, wild and scenic rivers, scenic roads, etc.
	• evaluation of alternatives or alternative modifications which totally avoid Section 4(f) resources
	• secondary and cumulative effects analysis, as necessary

ENVIRONMENTAL ISSUE	**Process Step 6: Identification of Preferred Alternative & Conceptual Mitigation** Refined comparative analysis of potential impacts (by alternative) is provided for each resource based on public and agency input on the draft environmental document.
AGRICULTURAL RESOURCES	• measures to address farm operational impacts • refined secondary and cumulative effects analysis, as necessary
AIR QUALITY	• Documentation of Toxic considerations in the selection process • Documentation of TAQMM of the alternatives • Documentation of CAQMM of the alternatives
AQUATIC RESOURCES	Note: Jurisdictional determination by USACE of aquatic resource mapping (wetlands and other waters); depends on project timing and study area or type of resources - determine earlier in order to receive permit earlier **Information necessary for the USACE to determine the Least Environmentally Damaging Practicable Alternative** • copies of all public comments received on Draft NEPA Document/Joint Public Notice (when requested by USACE), with applicant's review and response to each issue raised • comparative information on how successfully the alternatives address purpose and need • comparative analysis of impacts to natural, cultural and socioeconomic resources, based on best available engineering information • comparative analysis of cost and engineering feasibility, safety, and other information needed for practicability determination • project sponsor's preliminary Section 404(b)(1) analysis for their preferred alternative (refer to 404(b)(1) Guidelines) • description of avoidance and minimization activities, such as the steps taken at each crossing to avoid or minimize impacts to aquatic resources • results of secondary and cumulative effects analysis, including effects of discharges of fill material on the hydrology of adjacent aquatic resources (fragmentation, damming, isolation, etc.) • conceptual stormwater management design, including piping, basins and other drainage facilities • comparative availability (by project alternative) of suitable compensatory mitigation for unavoidable project impacts • conceptual aquatic and terrestrial mitigation plan for unavoidable project impacts a. wetlands 1 - location maps of sites 2 - availability & willingness of land owners 3 - restoration, creation, enhancement, and preservation components of preliminary plan [including identification of threats (development pressure) to any proposed preservation areas] 4 - reference wetland information used for mitigation site design 5 - goals and objectives of the mitigation plan, including benefits to the associated watershed 6 - land use plans for the surrounding area 7 - water budget 8 - construction plans & design specs, including excavation, grading, hydrologic alteration and soil amendment and planting details 9 - performance standards 10 - post-construction monitoring protocol 11 - long-term stewardship plan identifying the projected ownership and a conservation easement over the site (such as to non-profit conservation organization) to protect environmental values in perpetuity 12 - abatement/control plan for undesirable/invasive plant and animal species b. stream enhancement/restoration plan, including location maps of sites and conceptual design detail c. terrestrial wildlife mitigation plan (corridor preservation, passage structures, other compensatory measures), including location maps of sites and conceptual design detail d. permanent land protection mechanisms for all proposed mitigation sites e. threatened and endangered species clearance for all compensatory mitigation sites f. Section 106 clearance for compensatory mitigation sites
ENGINEERING INFORMATION	• revised mapping and documentation of environmental impacts, as appropriate, based on public and agency input • mapping and documentation of potential borrow and disposal sites, as well as construction staging areas, if appropriate
FISH & WILDLIFE RESOURCES	**Terrestrial Resources** • terrestrial habitat mitigation plan, such as corridor preservation, habitat assessment, etc. • refined secondary and cumulative effects analysis, as necessary **Threatened and Endangered Species** • project design changes to avoid impacts (based on informal consultation) • measures to minimize harm or compensate for unavoidable impacts • biological assessment for federally listed species, based on formal consultation with FWS and/or NMFS • refined secondary and cumulative effects analysis, as necessary **Fish and Wildlife Species** • refined Essential Fish Habitat information for preferred alternative, as needed • compensatory measures for specific species, such as passage structures, countersinking of culverts, etc. • refined secondary and cumulative effects analysis, as necessary
HAZARDOUS WASTE & BROWNFIELDS	• documentation of hazardous waste plumes and type(s) of pollutants, if appropriate • refined secondary and cumulative effects analysis, as necessary
CULTURAL RESOURCES - HISTORIC & ARCHEOLOGY	**Historic and Archeology** • completed Phase II evaluation level survey and concurrence on eligibility, if not completed in previous step • consultation on effects; identification of potential avoidance, minimization, and/or mitigation measures, as appropriate • if Adverse Effects are anticipated, notification to the Advisory Council on Historic Preservation; draft documentation of finding of effects, and MOA or programmatic agreement as necessary • for Section 4(f), documentation of coordination with consulting parties and with officials having jurisdiction over the resources • refined secondary and cumulative effects analysis, as necessary • concurrence on finding of effect
PHYSIOGRAPHY	• studies as needed, if project issues warrant additional details on groundwater, geology, acid bearing rocks, cut and fill information, etc. • refined secondary and cumulative effects analysis, as necessary
SOCIAL/ ECONOMIC	• documentation of any changes in impacts from alternatives raised by the public or agencies • documentation of any mitigation measures developed to address issues raised by the public or agencies • for Section 4(f), documentation of coordination with officials having jurisdiction over the resources • refined secondary and cumulative effects analysis, as necessary

ENVIRONMENTAL ISSUE	**Process Step 7: Final NEPA Document** Documentation of changes in impacts or mitigation measures, resulting from agency and public input, is refined/updated.
AGRICULTURAL RESOURCES	• documentation of public input
AIR QUALITY	• Documentation of the Toxic consideration including the construction of the proposed action • Re-check regional air quality analysis and obtain current MPOI programming document to ensure no major changes occured due to the passage of time
AQUATIC RESOURCES	Note: Jurisdictional determination by USACE of aquatic resource mapping (wetlands and other waters); depends on project timing and study area or type of resources - determine earlier in order to receive permit earlier • USACE Jurisdictional Determination for LEDPA/preferred alternative, if not previously accomplished • documentation of information submitted to USACE for their decision on the LEDPA/preferred alternative (to be presented in the Final NEPA document [see information identified in Step 6]) • documentation of public input Note: If the project sponsor requests a USACE permit decision (see Step 10) at the time of the FHWA Record of Decision (ROD) or Finding of No Significant Impact (FONSI), then information needed for a USACE permit decision must be provided in the Final NEPA document
ENGINEERING INFORMATION	• data necessary to address public and agency comments on the draft NEPA document • documentation of prior work and ongoing coordination • legal sufficiency review of FEIS by FHWA
FISH & WILDLIFE RESOURCES	**Terrestrial Resources** • refined/updated terrestrial habitat mitigation plan • documentation of public input **Threatened and Endangered Species** • refined/updated measures to minimize harm or compensate for unavoidable impacts • finalized biological assessment for federally listed species • biological opinion prepared by FWS or NMFS, if necessary • documentation of public input **Fish and Wildlife Species** • refined/updated terrestrial fish and wildlife mitigation plan • documentation of public input
HAZARDOUS WASTE & BROWNFIELDS	• preliminary remediation plan • documentation of public input
CULTURAL RESOURCES - HISTORIC & ARCHEOLOGY	**Historic and Archeology** • executed MOA (prior to Step 8) • legal sufficiency review of Section 4(f) evaluation by FHWA attorneys • documentation of public input
PHYSIOGRAPHY	• documentation of public input
SOCIAL/ ECONOMIC	• legal sufficiency review of Section 4(f) evaluation by FHWA attorneys • documentation of public input

ENVIRONMENTAL ISSUE	Process Step 8: Record of Decision
FHWA/DOT REQUIREMENTS	• decision on selected alternative - reference draft and final NEPA document • Section 4(f) discussion • environmentally preferred alternative/LEDPA • measures to minimize harm • mitigation commitments • monitoring and enforcement programs/activities • data necessary to address substantive public or agency concerns on the FEIS

ENVIRONMENTAL ISSUE	Process Step 9: Project Design & Final Minimization and Mitigation Coordination
AQUATIC RESOURCES	• final compensatory mitigation design plans, including final version of all items listed (as part of mitigation plans) in Step 6 • see information listed in Step 10
AIR QUALITY	• Document all mitigation measures are included final design
ENGINEERING INFORMATION	• refined design plans (1" = 50', etc.) • Mitigation Report and avoidance details (to be integrated into design) • data needed for reevaluation of final NEPA document
CULTURAL RESOURCES - HISTORIC & ARCHEOLOGY	• design plans incorporating any avoidance/minimization measures and other commitments as described in the executed MOA

ENVIRONMENTAL ISSUE	**Process Step 10: Final Permit Decision** This step may occur at the time of the ROD, depending on the project and the level of design available.

AQUATIC RESOURCES	**Information Necessary to Make a USACE Permit Decision**
	• project plans at scale determined by the team, with the following information color-coded:
	  - existing road (if the project is a road widening)
	  - proposed road right-of-way and limits of all permanent construction activities (including cut and fill lines)
	  - temporary impacts, including those outside of right-of-way (staging areas, construction access, causeways, mats, etc.)
	  - typical roadway sections
	  - USACE verified jurisdictional limits (mean high water, ordinary high water, upland/wetland boundary lines)
	  - design details for all fills and structures at all crossings of Waters of the US (invert/outlet elevations, dimensions, slope, grade, countersinking, abutment locations, etc.)
	  - slope protection/stream bank stabilization activities (riprap, gabions, etc.)
	  - design details of all channelization activities, relocated waterways, and stormwater management facilities
	• tables showing calculations of all proposed impacts to Waters of the US, categorized for each crossing by resource classification (Cowardin) and construction activity (fill, excavation, structure, etc.); include secondary and cumulative impacts to Waters of the US
	• documentation demonstrating how each impact to Waters of the US was minimized to the maximum extent practicable
	• final compensatory mitigation design plans (see Step 6)
	• identification of borrow and waste sites, including potential impacts, if available
	• resolution of issues associated with proposed impacts to federally listed threatened and endangered species, Essential Fish Habitat, and Section 106 properties
	• engineering details (see Engineering Information block)

ENGINEERING INFORMATION	**Design Details Refined to Level Required for Permit Decision**
	• plans showing:
	  • existing road locations
	  • USACE verified jurisdictional limits (mean high water, ordinary high water, upland/wetland boundary lines)
	  • final horizontal and vertical alignments in USACE verified jurisdictional Waters of the US, including wetlands
	  • final structure type, size, & location details (pier locations, piles, limits of disturbance) within USACE verified limits
	  • final typical sections (cut and fill lines, limits of construction/disturbance, right-of-way width, lane/sidewalk/median widths, etc.)
	  • management of traffic & phasing details, if required
	  • Mitigation Report and details, integrated into design

FISH & WILDLIFE RESOURCES	**Threatened and Endangered Species** • biological opinion (by FWS or NMFS), if not previously prepared

Process Step 11: Project Implementation and Monitoring
• project construction schedule • mitigation status reports (wetlands, threatened and endangered species, cultural resources, etc.), as needed • monitoring and enforcement activities

ENVIRONMENTAL ISSUE	Data Sources
AGRICULTURAL RESOURCES	• NRCS soil surveys • aerial photographs • county data bases • state Department of Agriculture maps • farmland assessment reports • interviews with farm owners/operators • public input
AIR QUALITY	• state Air Quality Office • Long Range Plan/Transportation Improvement Plan
AQUATIC RESOURCES	• USGS mapping • National Wetland Inventory Maps • NRCS soil surveys • infrared aerial photographs • state/federal natural resource agencies • existing surveys, studies and published reports on species occurrence and water quality • field view(s) • 1987 USACE Wetland Delineation Manual • 404(b)(1) Guidelines (or checklist when available or appropriate) • public input
ENGINEERING INFORMATION	• AASHTO design manual • state DOT design manuals • functional classification maps • existing origin and destination studies • travel demand modeling results • existing transit routes • natural, socio-economic and cultural environmental resource data • state greenway maps • state bikeway plan • DOT staff (planners, engineers, travel forecasters, etc.) • local master plans • zoning maps • employee database information from major employers • existing employer TDM agreements • committed capital projects in study area • historic real estate values • state DOT cost estimate guidelines • public input
FISH & WILDLIFE RESOURCES	**Terrestrial Resources** • Andersen Land Use classifications for cover types • field view(s) • public input **Threatened and Endangered Species** • state/federal natural resource agencies • data collected through informal consultation with FWS and/or NMFS • public input **Fish and Wildlife Species** • NMFS • state natural resource agencies • surveys, studies, and published reports on species occurrence • public input

ENVIRONMENTAL ISSUE	Data Sources
HAZARDOUS WASTE & BROWNFIELDS	• various lists (RCRA, CERCLA, National Priority List, etc.) • EPA databases and website • state lists and data bases • field visit (to identify gas stations, drycleaners, etc.) • public input
CULTURAL RESOURCES - HISTORIC & ARCHEOLOGY	• existing inventories • SHPO and THPO (mapping, existing inventory forms, etc.) • windshield surveys and field views • county historic commissions • local historical societies • public input (resource identification, impacts from alternatives, etc.)
PHYSIOGRAPHY	• USGS quadrangle maps (1:24,000, 1:100,000, or 1:250,000 scales) • Digital Raster graphics, digital line graphs, digital elevation models • NRCS soil surveys • state or local authorities • USGS or state aquifer or groundwater maps/studies • USGS or state surficial geology maps at state or county scale • EPA sole source aquifer designations • USGS Hydrologic Unit maps at 8 digit unit codes • Corps River Basin maps State sub-watershed mapping or studies • FEMA floodplain and floodway maps and studies • county geological survey maps • public input
SOCIAL/ ECONOMIC	• local planning offices • local master plans and zoning maps • census data (tracts or blocks) • tax maps • legislative directives • updated and verified traffic data (for noise studies) • public input, including opinion surveys